



B. Compensation for Teachers of Hard-to-Fill Subjects and Teachers in Hard-to-Staff Schools¹

Does evidence suggest that additional pay could overcome teacher reluctance to work in hard-to-staff schools? if so, how substantial would pay increases have to be in order to be effective?

A strong body of evidence indicates that schools with low levels of achievement and high concentrations of poor and minority students tend to have the greatest difficulty attracting experienced, qualified teachers. These schools are disproportionately staffed by teachers who are inexperienced and uncertified, and are teaching subjects that they have not been prepared to teach (see Clotfelter, Ladd, Vigdor, & Wheeler, 2007; Hanushek, Kain, O'Brien, & Rivkin, 2005; Ingersoll, 1996; Krei, 1998; Peske & Haycock, 2006; Useem, Offenberger, & Farley, 2007; and Wayne, 2002;).

The same schools that have difficulty attracting teachers also are almost twice as likely to have higher than average rates of teacher turnover (Ingersoll, 2001). Studies conducted in California, Texas, New York, Georgia, and Pennsylvania show that teachers generally leave schools with high concentrations of poor, minority, and low-achieving students and go to schools with higher levels of achievement and fewer low-income students of color (Carroll, Reichardt, & Guarino, 2000; Chester, Offenberger, & Xu, 2001; Freeman, Scafidi, & Sjoquist, 2002; Hanushek, Kain, & Rivkin, 2001; Lankford, Loeb, & Wyckoff, 2002). Whether the characteristics of the students themselves directly affect teachers' decisions to transfer or whether they serve as proxies for less desirable working conditions in the schools could not be determined from the data examined for these studies. However, a subsequent study of teacher turnover in California found that low salaries and poor working conditions were strong and significant predictors of teacher turnover (Loeb, Darling-Hammond, & Luczak, 2005). When these occupational characteristics were taken into account, the influence of student characteristics on teacher turnover was reduced.

An important finding of Lankford et al.'s New York study was that teachers who switched districts or left teaching altogether tended to be more highly skilled than the teachers who remained.² Moreover, salaries of new teachers were substantially lower for teachers who served poor, minority, and low-achieving students in the New York City-region than for other teachers in the same area. The researchers argue that,

¹ A portion of the information in this document is adapted from Prince, C. (2003). *Higher pay in hard-to-staff schools: The case for financial incentives*. Lanham, MD: Scarecrow Press.

² However, in a subsequent study conducted in a large, urban Texas district, Hanushek et al. (2005) found that the teachers who remained in their sample of schools were, on average, similarly qualified or better-qualified than the ones who left in terms of student achievement gains.

Transfer and quit behavior of teachers is consistent with the hypothesis that more qualified teachers seize opportunities to leave difficult working conditions and move to more appealing environments. Teachers are more likely to leave poor, urban schools and those who leave are likely to have greater skills than those who stay. The current salary structure for teachers likely does not alleviate the inequitable distribution of teachers and may well make it worse.

An important question for policymakers is whether increasing teacher pay in hard-to-staff schools can overcome teacher reluctance to work in them. Recent teacher surveys and research studies suggest that the answer is yes, but to be effective the increases would have to be substantial. Washington state teachers who were surveyed in 2006 reported that, on average, a fair incentive to compensate teachers who work in high-poverty, low-performing schools would be \$4,280 (Goldhaber, DeArmond, & DeBurgomaster, 2007). When responses from individuals who thought that no amount of additional pay was fair (i.e., responses of \$0) were excluded from the analyses, the average increased to \$5,322.

To date, little empirical research has been conducted to determine how big financial incentives need to be to attract and retain teachers in hard-to-staff schools. One of the few studies to examine specific incentive programs was conducted by Clotfelter, Glennie, Ladd, and Vigdor (2006), who analyzed teacher turnover patterns in North Carolina between 2001 and 2004. At that time, the state was offering \$1,800 annual bonuses to certified mathematics, science, and special education teachers working in high-poverty, low-performing schools. By examining teacher mobility patterns before and after the incentive program was established, the researchers estimated that the effect of this relatively modest bonus was sufficient to reduce teacher turnover by 12 percent.

Other researchers have developed models to estimate the effects of variations in teacher pay among districts and schools on teacher transfer and exit decisions. Using private school salary data from the 1999–2000 Schools and Staffing Survey, DeArmond and Goldhaber (2007) estimated that a private school teacher who moves from a low-poverty school to a high-poverty school would increase his or her salary by about \$1,800. But the researchers caution that,

We cannot say whether or not an \$1,800 incentive would be enough to encourage public school teachers to shift from low- to high-poverty schools. Indeed, our study suggests that there is no easy, mechanical way to estimate the right amount. Instead, figuring out how much to pay teachers to attract them to more difficult assignments will require experimentation with different levels of incentive for different types of schools.

Studies conducted in Wisconsin and Texas suggest that to be effective, increases in pay may need to be substantially larger to offset the labor market disadvantages that some schools face. For example, when Imazeki (2005) estimated the effects of wage increases on teacher transfer and exit patterns in Wisconsin, she found that teacher pay would have to increase by more than 15 percent to 20 percent to reduce teacher attrition rates in Milwaukee to levels similar to an average district in Wisconsin. Similarly, Hanushek et al. (2001) estimated the effects of new teacher salaries and other student and teacher characteristics on the probability that teachers would leave Texas school districts. This led them to conclude that,

schools serving a high proportion of students who are academically very disadvantaged and either black or Hispanic may have to pay an additional 20, 30, or even 50 percent more in salary than those schools serving a predominantly white or Asian, academically well-prepared student body.

It is important to note, however, that the size of the salary increase need not be as large if districts improve school working conditions or take other steps to make hard-to-staff schools more desirable places to work. This is because evidence suggests that compensation is only one of many job attributes that matter to teachers.

References

- Carroll, S., Reichardt, R., & Guarino, C. (2000). *The distribution of teachers among California's school districts and schools*. (MR-1298.0-JIF). Santa Monica, CA: RAND Education. Retrieved December 7, 2007, from http://www.rand.org/pubs/monograph_reports/2007/MR1298.0.pdf
- Chester, M. D., Offenberg, R., & Xu, M. D. (2001). *Urban teacher transfer: A four-year cohort study of the School District of Philadelphia faculty*. Paper presented at the American Educational Research Association Annual Meeting, Seattle, WA.
- Clotfelter, C. T., Glennie, E., Ladd, H. F., & Vigdor, J. L. (2006). *Would higher salaries keep teachers in high-poverty schools? Evidence from a policy intervention in North Carolina*. (NBER Working Paper No. 12285). Cambridge, MA: National Bureau of Economic Research.
- Clotfelter, C., Ladd, H. F., Vigdor, J. L., & Wheeler, J. (2007). *High-poverty schools and the distribution of teachers and principals*. (Working Paper 1). Washington, DC: CALDER Urban Institute, National Center for Analysis of Longitudinal Data in Education Research. Retrieved December 7, 2007, from http://www.caldercenter.org/PDF/1001057_High_Poverty.pdf
- DeArmond, M., & Goldhaber, D. (2007). *A leap of faith: Redesigning teacher compensation*. School Finance Redesign Project. (Working Paper 25). Seattle, WA: Center on Reinventing Public Education, University of Washington. Retrieved December 7, 2007, from http://www.schoolfinanceredesign.org/pub/pdf/wp25_dearmond.pdf
- Freeman, C., Scafidi, B., & Sjoquist, D. (2002). *Racial segregation in Georgia public schools 1994–2001: Trends, causes and impact on teacher quality*. (FRP Report No. 78). Atlanta: Georgia State University.
- Goldhaber, D., DeArmond, M., & DeBurgomaster, S. (2007). *Teacher attitudes about compensation reform: Implications for reform implementation*. School Finance Redesign Project. (Working Paper 20). Seattle, WA: Center on Reinventing Public Education, University of Washington. Retrieved December 7, 2007, from http://www.schoolfinanceredesign.org/pub/pdf/wp20_goldhaber.pdf

- Hanushek, E. A., Kain, J. F., O'Brien, D. M., & Rivkin, S. G. (2005). *The market for teacher quality*. (NBER Working Paper 11154). Cambridge, MA: National Bureau of Economic Research. Retrieved December 7, 2007, from <http://edpro.stanford.edu/hanushek/admin/pages/files/uploads/w11154.pdf>
- Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (2001). *Why public schools lose teachers*. (NBER Working Paper 8599). Cambridge, MA: National Bureau of Economic Research.
- Imazeki, J. (2005). Teacher salaries and teacher attrition. *Economics of Education Review*, 24, 431–449. Retrieved December 7, 2007, from <http://www-rohan.sdsu.edu/~jimazeki/papers/EERAugust2005.pdf>
- Ingersoll, R. M., & Gruber, K. (1996). *Out-of-field teaching and educational equality*. (NCES 96–040). Washington, DC: U.S. Department of Education, National Center for Education Statistics. Retrieved December 7, 2007, from <http://nces.ed.gov/pubs/96040.pdf>
- Ingersoll, R. M. (2001). *Teacher turnover, teacher shortages, and the organization of schools*. Seattle, WA: University of Washington, Center for the Study of Teaching and Policy. Retrieved December 7, 2007, from <http://depts.washington.edu/ctpmail/PDFs/Turnover-Ing-01-2001.pdf>
- Krei, M. S. (1998). Intensifying the barriers: The problem of inequitable teacher allocation in low-income urban schools. *Urban Education*, 33(1), 71–94.
- Lankford, H., Loeb, S., & Wyckoff, J. (2002). Teacher sorting and the plight of urban schools: A descriptive analysis. *Educational Evaluation and Policy Analysis*, 24(1), 37–62. Retrieved December 7, 2007, from http://www.teacherpolicyresearch.org/portals/1/pdfs/Teacher_Sorting_and_Urban_Schools_EEPA.pdf
- Loeb, S., Darling-Hammond, L., & Luczak, J. (2005). How teaching conditions predict teacher turnover in California schools. *Peabody Journal of Education*, 80(3), 44–70.
- Peske, H. G., & Haycock, K. (2006). *Teaching inequality: How poor and minority students are shortchanged on teacher quality*. Washington, DC: The Education Trust. Retrieved December 7, 2007, from <http://www2.edtrust.org/NR/rdonlyres/010DBD9F-CED8-4D2B-9E0D-91B446746ED3/0/TQReportJune2006.pdf>
- Prince, C. D. (2003). *Higher pay in hard-to-staff schools: The case for financial incentives*. Lanham, MD: Scarecrow Press.
- Useem, E., Offenber, R., & Farley, E. (2007). *Closing the teacher quality gap in Philadelphia: New hope and old hurdles*. Philadelphia: Research for Action. Retrieved December 7, 2007, from http://pdf.researchforaction.org/rfapdf/publication/pdf_file/297/Useem_B_Closing_the_TQ_Gap.pdf

Wayne, A. (2002). Teacher inequality: New evidence on disparities in teachers' academic skills. *Education Policy Analysis Archives*, 10(30). Retrieved December 7, 2007, from <http://epaa.asu.edu/epaa/v10n30/>

This synthesis of key research studies was written by:

Cynthia D. Prince, Vanderbilt University; Julia Koppich, Ph.D., J. Koppich and Associates; Tamara Morse Azar, Westat; Monica Bhatt, Learning Point Associates; and Peter J. Witham, Vanderbilt University.

We are grateful to Michael Podgursky, University of Missouri, and Anthony Milanowski, University of Wisconsin-Madison, for their helpful comments and suggestions.